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# ERP INTRODUCTION IN CHINA: ANALYSING CULTURAL PROBLEMS USING STRUCTURATION THEORY

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## Abstract

*In this paper we present potential insights provided by Giddens' structuration theory to study the effects of cultural differences experienced by western companies establishing Enterprise Resource Planning (ERP) software in their Chinese subsidiaries. We use the data from a case study of a French firm's ERP project in its Chinese subsidiary to demonstrate the appropriateness of structuration theory to study such social systems. We find that five of Giddens' ten guidelines "for the overall orientation of social research" are indeed very helpful in understanding the problems that occurred in this particular situation.*

*Keywords: ERP, China, Structuration theory, Culture.*

# 1 INTRODUCTION

The purpose of our study is to investigate the effects of cultural differences on an ERP implementation in China. Understanding such effects may enable international companies to be more proactive in planning for multinational ERP implementation in that country. Lessons learnt can be of relevance to other application types and other countries. During the last decade, numerous failures have shown that no universal system can be implemented in different countries successfully without resolving misfits resulting from cultural differences (Besson, 1999; Jacobs & Whybark, 2000; Sheu et al. 2003, Zhang et al. 2002).

Most of the past research works realized on ERP international projects have been done focusing on technical or business aspects (Davenport, 1998; Markus *et al*. 2000). Through this study, we address it from another perspective: an ERP system is a social system. This assumption allows us to study ERP systems from a broader perspective. We consider here an ERP system as a set of interactions between a software customized by the vendor's team, the internal IS consultant team and the local users.

By using the professional experience of one of the co-authors (who acted as ERP consultant in China before becoming a full time researcher), we aim to demonstrate that the use of structuration theory can provide important and original insights enabling us to study such social phenomena. We start with a short presentation of Giddens' theory (Giddens, 1984) and its extension by Orlikowski (1991). We then analyze an ERP failure of a French firm in its China subsidiary using structuration theory. This provides valuable insights on the reasons for the failure.

# 2 HUMANS, STRUCTURES, CULTURE AND TECHNOLOGY

In this section we discuss the different elements that may influence the success or failure of an information system. We use Structuration Theory, proposed by Giddens (1984), to inform our analysis. In its initial formulation this theory had no direct link with the field of Information Systems, but seeing an Information System as a Social System can provide important insights which may be used to support the implementation of such 'systems' in an organization.

In Giddens' view of social reality, both objective and subjective dimensions are equally important. He argues that social reality is constituted of subjective human actors and institutional properties (structures). The main concern of Giddens is to go beyond the classical structure/action cleavage.

Giddens proposes what he calls the *duality of structure* to explain society as a whole. He suggests that human action can be seen on the one hand to constitute the institutional properties of social systems, yet on the other hand it can be seen to be constituted by institutional properties. This means that the structure or institutional properties of social systems are created by human action and then serve to shape future human action. Giddens insists that the structures, because they are produced and reproduced by human actions, are simultaneously constituted (by the actors) and constituent (for the future actions of the actors). This explains the concept of "duality" between human actors and structures (see figure 1).

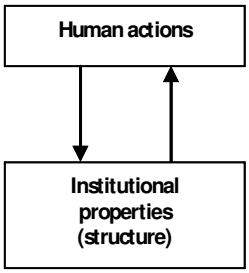



*Figure 1: Duality between human actors and structures*

This concept of "duality" between institutional properties and human actors is extremely important in our own study. Indeed, we use this concept to explain that on the one hand an Information System (IS) is designed and developed by human beings evolving under the influence of a particular context (defined by its institutional properties and cultural environment), yet on the other hand an IS (once installed in an organization) influences human actions. It leads us to review research around the concepts of 'culture' and 'context'.

## 2.1 Culture and Context concepts

Giddens defines *context* as the structure or environment within which social interaction occurs. He suggests that these social interactions can be analyzed at multiple levels including their organizational, industrial, economic and political contexts.

According to Giddens, while context is concerned with the structure or environment within which the social interaction occurs, *culture* is concerned with the meanings that are ascribed to that context. One issue that becomes apparent when considering culture is the degree to which it is believed to be fixed or variable. Hofstede's (1991) national cultural approach sees national culture as a stable entity. Hofstede defines culture as "the collective programming of the mind". We prefer to follow the alternative view defining culture as variable, fragmented and historically situated. It fits with Giddens' ideas that emphasize the permeability and fluidity of culture.

Some research in the field of IS has investigated the possibility that culture and context are key variables affecting the success of IS implementation. Montealegre (1997) studied the interplay between IT and the social mileu, as well as the organizational context. Using the language of structuration theory, he shows that different social settings engender different technologies, while these, in turn, reinforce or transform organizational and social structures over time.

Other research is also consistent with Giddens' understanding of context and culture. Weisinger and Trauth (2006), for example, show how a culture of local practices is influenced by multiple contexts, including that of the home and host countries, the corporation and the IT industry. Their findings, through two different case studies, show that the culture of each workplace emerged as a unique entity that resulted from a combination of cultures: the corporate culture of the firm, the national culture of the firm's headquarters, the industry field culture and the national culture of the local context. They illustrate their approach with examples from a US multinational IT firm operating in Ireland.

Avgerou (2002) in the preface to her book "Global Diversity in Information Systems" expresses the essential challenge for all IS practitioners and academics to understand better how the human context surrounding technology influences its development, implementation and use.

To summarize, we suggest that the interaction between technology, structures, human actions and surrounded contexts is a key field of investigation for the study of IS implementation. The theory of Giddens operates at a high level of generality but provides important insights into the interaction between human actors and structures.

## 2.2 Empirical research on Structuration theory

The final aspect of Giddens' theory to be discussed here is the relevance (or not) of structuration theory to empirical research. Some critics have suggested that it may be considered, to some extent, as operating at a too high a level of generality to provide any relevant guidelines for empirical studies. Moreover, Giddens himself seems to have changed his mind several times concerning the use of his theory for any practical social research. In the original version of its book, he provided a ten-point summary of the key features of structuration theory (Giddens, 1984; 281) to suggest "guidelines for the overall orientation of social research". Later he stated that structuration cannot be used as a research framework as his principles "are essentially procedural and do not supply concepts useful for the actual prosecution of research" (Giddens, 1990; 311). He also seems sceptical of those "who have attempted to import structuration theory *in toto* into their given area of study", suggesting that the most fruitful researches have been those which use "concepts either from structuration, or other aspects of my writing, used in a spared and critical fashion" (Giddens, 1991; 313). In the context of our study, we do not address an exact illustration of Giddens' Theory by following its original concepts step-by-step. We demonstrate that his broad vision of analyzing social systems (as a duality process between human actors and structures) can help us understand the effects of cultural differences on international ERP projects.

We will now focus on the work of Orlikowski (1991) who has proposed an extension to Giddens' structuration theory which has more applicability in the IS field.

## 2.3 Orlikowski's extension to the model

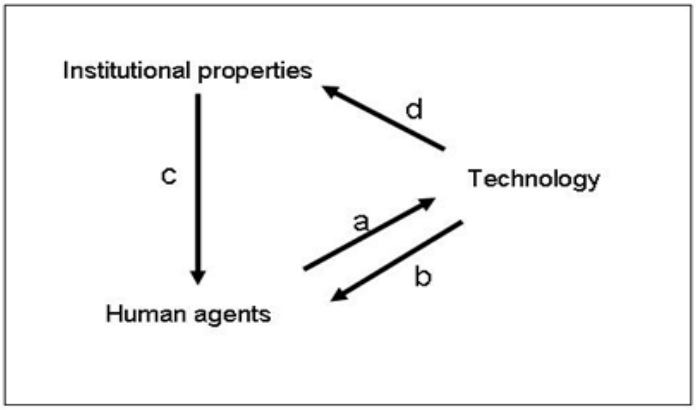
Giddens himself has written very little that directly relates to technology. In the original book "Constitution of society" (Giddens, 1984), there is a short reference to the role of IT in time space distantiation. He argues that email and video may substitute to some extent for face-to-face interaction in achieving social integration. However, there are no further references relating IT systems to structural properties. Nevertheless, many IS researchers have made reference to Giddens' theory in their work. The most influential of these has been the Orlikowski (1991). She has suggested the term "duality of technology" to explain that "technology is created and changed by human action, yet it is also used by humans to accomplish some action". She also argues the importance of "time-space discontinuity" between software design and its use.

Figure 2, which is taken from Orlikowski (1991), presents the relationship between institutional properties, human agents and technology.

Orlikowski emphasizes the fact that the different relationships between human agents, institutional properties and technology may vary over time and sometimes, act in contradiction with one another, thus creating points of tension that may give rise to change and transformation.

From this schema (Figure 2), Orlikowski draws four key influences that operate continuously and simultaneously in the interaction between technology and organizations:

- Information technology is the outcome of human action being developed and used by humans.
- Information technology is also the means of other human action, serving to facilitate the accomplishment of computer mediated-work or communication.
- Information technology is built and used within particular social contexts.
- Interaction with information technology influences the social contexts within which it is built and used.




| Arrow | Type of influence | Nature of influence |
|---|---|---|
| a | Information technology as a product of human action | Information technology is an outcome of such human action as design and development, appropriation and modification |
| b | Information technology as a medium of human action | Information technology facilitates and constrains human action through the provision of interpretive schemes, facilities and norms |
| c | Conditions of interaction with information technology | Institutional properties influence humans in their interaction with information technology, such as, intentions, designs standards, professional norms, state of the art in materials and knowledge, and available resources (time, money, skills) |
| d | Consequences of interaction with information Technology | Interaction with information technology influences the institutional properties of an organization, through reinforcing or transforming the systems of signification, domination and legitimation |

*Figure 2: The structurational model of technology (Orlikowski, 1991)*

Our study will be focused on the two last points in the context of a French firm attempting to implement an ERP system in China. On the one hand, we can affirm that the current problems from the ERP system occurred because it was originally designed and developed within a particular social context but used within other social contexts, and on the other hand the IT solution influences the social contexts within which it is used. In the following section, we present a discussion of a situation of conflict between the design of software in the west and its use in China. We argue that structuration theory and the 'technology' dimension added by Orlikowski, as presented above, informs this discussion and provides valuable insights.

# 3 THE CASE STUDY IN CHINA

## 3.1 Company Background

The 'facts' of the case study are detailed in Avison and Malaurent (2007). The company studied is a large international organization in the energy business with headquarters in France. It is established in more than 40 countries with 70,000 employees worldwide. The company decided on a common enterprise resource planning (ERP) system which started to rollout in Europe, then in United States

and Africa. Despite success internationally, the decision to implement an ERP system in China was a challenging one because of the low success rate of such systems for foreign companies in China.

In 2000 the company agreed a joint venture (51% of the shares owned by the French firm and 49% of the shares owned by the Chinese firm) with the biggest electricity distribution company in China for the building of new infrastructure. Such joint ventures were the only inroad into the Chinese market at the time. From a functional perspective, all the different managerial positions were duplicated. This meant that the joint-venture had two CEOs, two financial directors, two production managers and two sales managers. This original type of hierarchical structure was setup in order for the two sides to take major decisions with one accord. From the Chinese side, they were all male, senior managers, without any experience and knowledge about ERP systems. From the French side, they were all male, senior managers, and with good experience of the ERP company template. Indeed, they worked previously in different subsidiaries of the French company using the worldwide ERP system.

### 3.2 Methodology

The following analysis will follow the point of view of one of the authors who acted as consultant for the pilot implementation of the ERP system at the Shanghai branch. He worked as internal ERP consultant for the French subsidiary established in China. He was a coordinator for the data collection of the legacy systems and also acted as a project manager. In retrospect he could be seen as a type of participant observer (though this claim could not be justified in research terms as at the time he was consultant and not researcher, even if he could now be seen as a reflective practitioner (Schön,1983)).

The project duration for the initial phase of the project in China was one year. He worked on the project for 3 months before the initialization phase and he finished his mission 3 months after go-live. He co-ordinated the task of managing key users and preparing the data conversion from the legacy system (Microsoft Access databases and Excel spreadsheets). This included cleansing the databases, deleting replicated entries, and translating supplier and customer data from English to Chinese. This process was followed by creating the SAP master files with this cleansed data. The next stage involved co-ordinating the training of users by the SAP consultant. During implementation, he co-ordinated follow-up assistance, in particular documentation support and daily conference calls with the French consultants.

### 3.3 Outline of project

The aim of the project was to implement modules of SAP R/3 4.5 in the subsidiary company, the pilot site, located in Shanghai. The particular template designed by staff in the French headquarters focused on five modules related to financial aspects (finance, control, sales and distribution, materials management and project system).

There were two teams involved in the implementation. The French team consisted of five members of staff and the Chinese team consisted of three external consultants from a leading international IT services company. None of the French consultants had worked with Chinese people previously. The English level of the French consultant team was good. In the finance and control modules, the Chinese consultant had worked for western companies in China and spoke English fluently. However, for the sales and distribution, materials management and project system modules, the Chinese consultants had a poor level of English (they could read and understand documents but they were not able to speak well) and never had experience with western companies.

The usual procedure for this kind of ERP implementation is to send ERP consultants from headquarters on the local site for a two week period in order to communicate the basics of the global template to the local project team. Then, they controlled the project from Europe through daily conference calls. The local project team was composed of project managers (three European expatriates), key users and also external local ERP consultants.

# 4 ANALYSIS OF THE CASE STUDY USING STRUCTURATION THEORY

In order to demonstrate that the use of Structuration Theory is a relevant and powerful tool to study the implementation of this global Information System in a Chinese subsidiary, we will use five of the ten points that are the key features of structuration theory designed by Giddens as "guidelines for the overall orientation of social research". We see these five points as relevant for our study:

- All human beings are knowledgeable agents.
- The study of the context is inherent in the investigation of social systems.
- Routine, psychologically linked to the minimising unconscious sources of anxiety, is the predominant form of day-to-day action.
- The study of power cannot be regarded as second order consideration
- Structural properties are particularly important since they specify overall types of societies.

*All human beings are knowledgeable agents.*

During the whole duration of the project, we observed the low level of involvement by local employees although most of them were conscious of the importance of the implementation of the ERP system to the company and the opportunities involvement provided. They knew that it can be a great opportunity for them to learn to work with such a tool. For example, it was very valuable for them on the job market. Yet most employees did not feel involved in the project. The main reason was related to the fact that the ERP system itself and all the communication related to the application (blueprints, documents, and training sessions) were in English. Yet 80 percent of the employees did not have a sufficient level of English to work fully with that language. Consequently, local employees were rapidly conscious that the implementation project will act as a discriminatory process to reject them from the project because they would be seen to lack this important requirement. Some employees had a reasonable level of English, and they took the opportunity to work harder and keep connected with the project evolution. But others gave up and stopped attending the training sessions.

For us, this 'knowledgeability' of the employees being rejected from the project is the main reason for their low involvement. An interesting question relates to whether strategic managers and IS managers from the company headquarters in France were conscious of the implications of all communications being in English. Since all human beings are knowledgeable agents and these people already had feedback from previous implementations in Europe, United States and Africa, we can assume that they were aware of the consequence of such a strategy. Nevertheless, we can also assume that they did not realize that this could be a reason for implementation failure of the ERP system in China.

*The study of the context is inherent in the investigation of social systems.*

This topic is linked with the last point. It relates to the question of whether top managers were conscious and knowledgeable about the Chinese context. The answer is surely negative. Indeed, in addition to the language difficulties, the company also experienced major problems with Chinese laws and regulations. Management did not study Chinese regulations and standards. For example, they assumed that China was in complete accordance with worldwide accounting standards. It was an incorrect assumption in the sense that Chinese regulations require specific reports that need special data processing. Another pitfall related to the lack of knowledge of the different "behaviours" of Chinese and Europeans. For example, the French team of consultants did not hesitate to expose weaknesses of the Chinese local managers in front of their subordinates. This lack of knowledge about the importance of "hierarchy" in China caused some crises which also impacted on the implementation process.

*Routine, psychologically linked to the minimising unconscious sources of anxiety, is the predominant form of day-to-day action.*

The point that we wish to relate here is not specifically related to the Chinese context. It is a global characteristic of human behaviour. People prefer to act in a certain environment, performing similar tasks on a regular basis that will minimize their source of anxiety. Giddens describes this type of behaviour by a need of "ontological security". Employees are looking for a sense of order and continuity in their day-to-day actions. Consequently, the implementation of an ERP system in the Chinese subsidiary may have been considered as a real threat to the ontological security of most employees. The difficulties experienced in this project discussed above (language, communication, ignorance about local regulations) may also have reinforced this feeling of anxiety and consequently led to employees rejecting the new IS.

*The study of power cannot be regarded as second order consideration.*

This concept of power relates here to the study of the context. This Chinese subsidiary was set up in 2000, as the result of an agreement with the biggest Chinese electricity distribution company and the French company (51% of shares are owned by the French company and 49% by the Chinese company). In the context of this project, the Chinese part had strong power over the employee's commitment and it seems that they did not push the local employees to be more involved than they were. We can assume that the Chinese managers, from the Chinese State Owned Enterprise (SOE), were, to a certain extent at least, 'afraid' of loosing control of the company activities with this new IS designed only by the French partner.

*Structural properties are particularly important since they specify overall types of societies.*

As a partial conclusion, we therefore argue that the structural properties have played a major role in the failure of this new IS. Structural properties are the result and the source of the contextual and cultural influences mentioned above. The two structural properties that we would like to underline here are the company staff structure and the legal structure.

The company staff was composed of 145 Chinese employees and 3 French expatriates. Consequently, even if management in the French headquarters considered this subsidiary as one of its worldwide companies, it would have been more reasonable to consider this subsidiary as a wholly Chinese company. Furthermore, the French Headquarters seems to have underestimated the power of the Chinese partner. In China, the policy of the original SOEs is to learn from the western partner's side about new technologies, new way of managing, etc., but not to loose the control of their activity.

# 5 DISCUSSION

From this analysis, we have underlined the major role played by an Information System in the duality between humans and structural properties. From the case presented above, it is clear, because of the insights provided by structuration theory and its extension model by Orlikowski, that the ERP system, designed by people in the French headquarters, has been built by human agents within a particular context that did not fit in with the Chinese structural properties and the local employees' characteristics. It fits within one of the influences of Orlikowski's extension model: *information technology is built and used within particular social contexts* (see section 2).

We suggest that for similar companies, a preliminary study of the context, following the five points presented above, may help to prevent future ERP project failures. From this study of structuration theory, insights on IS projects can be provided and we suggest a schema (figure 3) that aims to represent the different threats which may affect an international ERP implementation project. We split those influences into two different levels: micro and macro level.

From a *micro* level perspective, we look at the major role played by individuals in the acceptance of the new IS. The first characteristic of human behaviour to consider here is the "knowledgeability of agents". As shown in section 2, human beings are knowledgeable agents conscious about the stakes and difficulties of such projects. If the employees see some weaknesses in the future IS (for example, not being adapted to the local environment) or in the project organization (for example, low involvement of local managers) they may reject the new IS. The second characteristic of human behaviour to consider is the 'routine'. By default, Giddens (1984) demonstrates that human beings prefer to act in a certain environment, performing repetitive tasks. The implementation of a new ERP system can be perceived as a threat to the security of most employees. Consequently, the project team has to take into account this human behaviour characteristic to communicate the strengths and positive impacts of a future ERP system for their daily tasks.

From a *macro* level perspective, we look at the role of the local structures. As shown through our case study analysis, the local structures may be detrimental to the success of the project. We split this concept of structure in the study of the context (human resource specificities, local regulations, laws and technology) and in the study of power (political environment, existence of a local partner, strength of the partner, type of organization and distribution of authority).

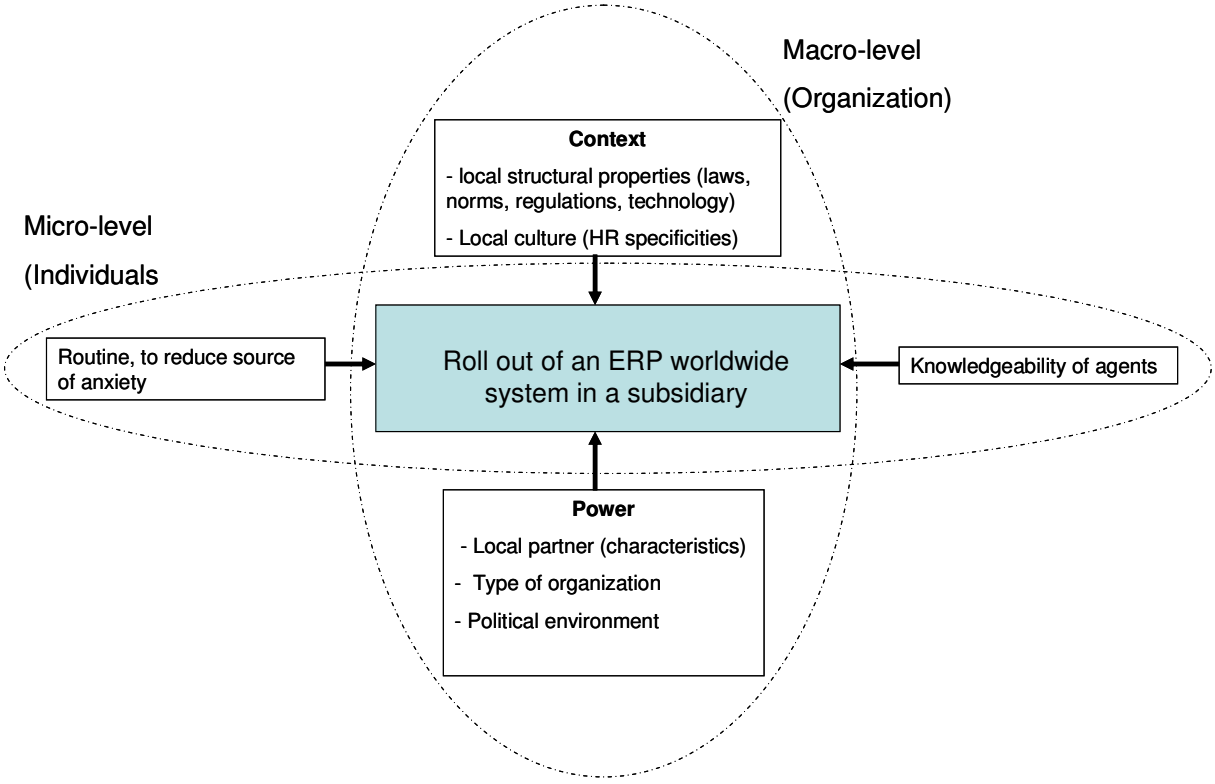



*Figure 3: Matrix of threats for an international ERP project*

This model does not cover the whole set of threats to an ERP project. As mentioned in section 1, we have limited the scope of our study to the 'social dimension' of an ERP system. If we want to build a complete picture, we should also consider the technical and business aspects of an ERP project. But this was not the objective of this paper.

This analysis carried out according to the 'philosophy' of structuration theory has provided insights into the reasons for the failure of an ERP system implemented by a French company in its Chinese subsidiary. In a general sense, we suggest that the use of the Giddens' theory as a theoretical

framework gives us a better understanding of those issues related to the transfer of technology and the rules and norms between different countries.

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